



United States Department of the Interior
FISH AND WILDLIFE SERVICE

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In Reply Refer To:
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DEC 11 2014

Ms. Jane M. Hicks
Regulatory Division
U.S. Army Corps of Engineers
1455 Market Street 16th Floor
San Francisco, California 94103-1398

Subject: Programmatic Biological Opinion for Issuance of Permits under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, including Authorizations Under 22 Nationwide Permits, for Projects that May Affect the Threatened Central California Tiger Salamander in Alameda, Contra Costa, San Mateo, Santa Clara, and Solano Counties, California

Dear Ms. Hicks:

This is the U.S. Fish and Wildlife Service's (Service) programmatic biological opinion for issuance of permits under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act (RHA), including 22 Nationwide Permits, in Alameda, Contra Costa, San Mateo, Santa Clara, and Solano counties, California. Nationwide Permits are authorized by the U.S. Army Corps of Engineers (Corps) under the Clean Water Act (33 U.S.C. 1251 *et seq.*). At issue are the adverse effects on the federally threatened Central California Distinct Population Segment (DPS) of the California tiger salamander (*Ambystoma californiense*) (Central California tiger salamander) and its designated critical habitat. This programmatic biological opinion was prepared under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*)(Act).

The Corps may append activities authorized under CWA and RHA permits in the above five San Francisco Bay Area counties to this programmatic biological opinion with the concurrence of the Service, provided the activities meet the suitability criteria for the threatened amphibian and its critical habitat, or the Service determines that implementation of appropriate additional Conservation Measures sufficiently reduces the effects of the action consistent with the intent of this programmatic biological opinion. The Service will consider appending projects located outside the action area provided the project meets the rest of the suitability criteria, on a case by case basis.

This programmatic biological opinion is based on the following sources of information: (1) designated critical habitat for the Central California tiger salamander (Service 2005a); (2) the 5-year review of the Central California tiger salamander (Service 2014); and (3) other information available

to the Service.

ADMINISTRATION OF THE PROGRAMMATIC BIOLOGICAL OPINION

This programmatic consultation will be implemented upon determination by the Corps that a proposed project that qualifies for authorization under one of the 22 Nationwide Permits described in the Project Description, or otherwise meets the suitability criteria set forth in this document, may affect the Central California tiger salamander and/or its critical habitat, as required by the implementing regulations for section 7 of the Act. The Corps will then provide the Service with all of the written documentation utilized to formulate its determination. Upon receipt of the appropriate information, the Service will review the material and evaluate whether it is appropriate to append the project to this programmatic biological opinion based on the level of effects, and the avoidance, minimization and compensation measures. The Service may determine some projects require separate Section 7 consultation and will not be appended to this programmatic biological opinion. If the Service does not concur the project is appropriate to be appended to this programmatic biological opinion, the Service will notify the Corps in writing. If the Service does concur it is appropriate to append the project to this programmatic biological opinion and if, in addition to the Central California tiger salamander, other listed species also will be adversely affected, the proposed action will be appended to this programmatic biological opinion and a biological opinion will be completed for the additional listed species. Both the appendage and the biological opinion will then be combined into a single document by the Service that will be issued to the Corps.

The action area of this programmatic biological opinion overlaps with several other mechanisms that authorize incidental take of the Central California tiger salamander, and these mechanisms include, but are not limited to, the 2007 East Contra Costa County Habitat Conservation Plan, the 2010 East Alameda County Conservation Strategy Programmatic Biological Opinion, and the 2012 Santa Clara Valley Habitat Plan. The applicant may seek incidental take authorization through one of these other mechanisms for projects that may affect the species, provided the sponsoring agency determines the applicant's project meets the criteria for inclusion under their respective mechanism, and subject to Service guidance and approval.

A key element of this programmatic biological opinion is that each separate permit action appended will have minimal adverse effects and low levels of incidental take of the Central California tiger salamander. Projects not appropriate to be appended to this programmatic biological opinion are those that exceed minimal adverse effects to this species, including direct, indirect, and cumulative effects and these would require separate consultation. At the Service's discretion, proposed actions that do not meet the suitability criteria may still be appended, if the complete implementation of appropriate additional Conservation Measures sufficiently reduces the effects of the action or that the project has minimal effects that are consistent with the intent of this programmatic biological opinion.

This programmatic biological opinion is effective for a period of five (5) calendar years from the date of its issuance and can be extended if deemed appropriate by both agencies. The Service will review this programmatic consultation, as appropriate, to ensure that its application is consistent with the intended criteria.

BIOLOGICAL OPINION

Description of the Action

Project Description

For this programmatic biological opinion, actions authorized by the Corps that may be appended consist of a variety of activities that may result in adverse effects to the Central California tiger salamander and /or its critical habitat on 1.0 acre or less per project of suitable upland habitat, or up to 1.0 acre of aquatic habitat/waters of the United States, or a combination of uplands and wetlands that is not larger than 1.0 acre in size, provided there is no or negligible permanent loss of the species' breeding habitat. The Corps and the Service may determine on a case by case basis that projects larger than 1.0 acre can be appended to this programmatic biological opinion based on the following criteria: the action has minimal effects to the listed species, the action is consistent with the intent of the programmatic biological opinion, and appropriate Conservation Measures are included. For the purposes of this programmatic biological opinion, temporary effects and permanent effects are defined as:

1. Temporary effects are defined as effects resulting from a Nationwide or other Corps permit-authorized activity that are short-term and do not result in adverse effects to Central California tiger salamander habitat that are longer than one year. All habitats will be restored to better or equal condition as before the project within one calendar year following initial disturbance. Disturbance may include alteration or reduction in vegetative cover or suitable shelter sites, such as rodent burrows, or other forms of cover. An elevation in ambient noise level, for example, also may be considered a disturbance. Temporary effects are those that denude, manipulate, or otherwise modify habitats from their existing, pre-project conditions as a result of project activities that may include, but are not limited to, staging, storage, lay down, vehicle access, borrow sites, disposal areas, vehicle parking, dredging, grading or discing where it affects burrows, and vegetation removal. In order to be considered a temporary effect, the affected site must be restored to baseline habitat values or higher within one calendar year following the date of initial disturbance.
2. Permanent effects are defined as effects resulting from project activities which remove existing habitat or essential habitat components that cannot be restored to pre-project conditions of equal or greater value within one calendar year of the date of initial disturbance. Projects that result in more than a negligible amount of permanent loss of the species' breeding habitat would not be appropriate to append to this programmatic biological opinion.

Projects that meet the suitability criteria and may involve some or all of the preceding activities are often authorized under the Corps' Nationwide Permit program. To guide the Corps during project evaluation, the Service has reviewed the Nationwide Permits the Corps has issued under 33 CFR 330.3 and has determined that projects typically authorized under the Nationwide Permits listed below may be appropriate to append to this programmatic biological opinion:

- (#3) Maintenance.
- (#5) Scientific Measuring Devices.

- (#6) Survey Activities.
- (#7) Outfall Structures.
- (#12) Utility Line Discharges.
- (#13) Bank Stabilization.
- (#14) Road Crossings.
- (#15) U.S. Coast Guard Approved Bridges.
- (#17) Hydropower Projects.
- (#18) Minor Discharges.
- (#19) Minor Dredging.
- (#23) Approved Categorical Exclusions.
- (#25) Structural Discharges.
- (#27) Wetland and Riparian Restoration and Creation Activities.
- (#31) Maintenance of Existing Flood Control Facilities.
- (#32) Completed Enforcement Actions.
- (#33) Temporary Construction, Access and Dewatering.
- (#37) Emergency Watershed Protection and Rehabilitation.
- (#38) Cleanup of Hazardous and Toxic Waste.
- (#44) Mining Activities.
- (#45) Repair of Uplands Damaged by Discrete Events.
- (#46) Discharges in Ditches.

Suitability Criteria

To make use of this programmatic biological opinion, the Corps will ensure that each Nationwide or other permit activity that is proposed for appendage satisfies the following criteria:

1. The Central California tiger salamander has been found to inhabit or utilize the action area through the result of a Service-approved protocol survey; or, the action area contains suitable habitat for breeding, foraging, sheltering, movement, or other essential behaviors; or the Corps is assuming the species will be affected by the proposed action; or the action area contains the species' critical habitat.
2. Each Nationwide or other permit activity appended to this programmatic biological opinion adversely affects no more than 1.0 acre of suitable Central California tiger salamander upland habitat or no more than 1.0 acre of its aquatic habitat/waters of the United States, or a combination of uplands and wetlands that is not larger than 1.0 acre in size, provided there is no or negligible permanent loss of the species' breeding habitat. This includes areas used for equipment staging areas, site access routes, laydown areas, construction, equipment storage, vehicle parking areas, and stockpile and debris storage areas.
3. Projects will not be appended to this programmatic biological opinion that occur in locations where the populations are so small and/or isolated that even the minor effects described in the programmatic biological opinion may have substantial adverse effects to the long-term survival and viability of the species within the recovery unit. This also includes projects that convert seasonal breeding habitat to perennial aquatic breeding habitat that would be suitable for non-native predators and competitors of the Central California tiger salamander.

4. The measures to reduce and/or avoid adverse effects to the Central California tiger salamander described in the Conservation Measures of this programmatic biological opinion will be fully implemented by the Corps through the applicant. The measures may be modified on a project-specific basis upon written concurrence by the Service.
5. The Corps through the applicant will include enhancement or establishment of habitat connectivity and safe wildlife passage across roads at locations most likely to benefit wildlife, whenever possible, as a conservation measure for Nationwide and other permit activities appended to this programmatic biological opinion.
6. Nationwide and other permits appended to this programmatic biological opinion are not interdependent or interrelated with other projects being proposed or implemented by the Corps through the applicant, other government agencies, or other parties. This includes actions which have been separated from each other as a result of funding, authorizations, or other constraints.
7. The Corps through the applicant will provide the following information to the Service with their request for appending each permit action to this programmatic biological opinion:
 - a. Corps Permit Application including the applicant's full name, mailing address, and telephone number, Assessor's Parcel Number(s), location coordinates, and project street address;
 - b. Corps-verified jurisdictional determination, and a map depicting all jurisdictional and non-jurisdictional aquatic features in the construction areas, borrow sites, laydown areas, access and parking areas, disposal sites, and all aquatic features that could potentially serve as the species' breeding habitat within the 1.3-mile dispersal distance of the boundary of the disturbed area(s);
 - c. Written description of the project, including but not limited to, construction methods, types and numbers of equipment, specific dates the work will occur, habitat restoration, Conservation Measures that will be fully implemented, a Relocation Plan, described below, and a project monitoring plan for the Central California tiger salamander;
 - d. A 7.5 minute U.S. Geological Survey topographic map or similar high-quality color topographic and aerial map clearly marked with the precise location of the project, construction areas, borrow sites, laydown areas, parking areas, disposal sites, restoration sites, California tiger salamander relocation site(s), potential barriers to dispersal to/from the project site, and other relevant features;
 - e. A map showing known listed plant populations and listed animal sightings, from the California Department of Fish and Wildlife's California Natural Diversity Data Base (CNDDB), and other sources, recorded within the action area and within a 10-mile radius of the project site;
 - f. A map (scale 1" = 100') delineating the major vegetation communities present on and adjacent to the project site. Color photographs of the major vegetation communities present on the project site will be included with the document, with the locations of where they were

- taken indicated on the vegetation map; and
- g. One plan view and a minimum of one typical cross section showing water bodies, vegetation types, work areas, roads, restoration sites, fueling, storage, parking, and staging areas.

Conservation Measures

General Conservation Measures

To reduce potential effects to sensitive biological resources, the Corps through its applicant shall incorporate construction Best Management Practices (BMPs) and avoidance and minimization measures into the proposed project. These measures will be communicated to the contractor through the use of special provisions included in the contract bid solicitation package. These measures include the following:

1. **Seasonal Avoidance.** Project activities will be scheduled to minimize adverse effects to the Central California tiger salamander and its habitat. Except for limited vegetation clearing necessary to minimize effects to nesting birds, disturbance to upland habitat will be confined to the dry season, generally May through October 15. However, grading and other disturbance in pools and ponds, if unavoidable, shall be conducted only when they are dry, typically between July 15 and October 15. Work within a pool or wetland may begin prior to July 15 if the pool or wetland has been dry for a minimum of 30 days prior to initiating work. All work would be limited to periods of low rainfall (less than 0.08 inches per 24-hour period and less than 40 percent chance of rain). Construction activities shall cease 24 hours prior to a 40 percent or greater forecast of rain from the National Weather Service (NWS). Construction may continue 24 hours after the rain ceases if no precipitation is in the 24-hour forecast. If work must continue when rain is forecast (greater than 40 percent chance of rain), a Service-approved biologist(s) shall survey the project site before construction begins each day rain is forecast. If rain exceeds 0.5 inches during a 24-hour period, work shall cease until NWS forecasts no further rain. Modifications to this timing may be approved on a case-by-case basis by the Service.
2. **Environmental Awareness Training.** Prior to the start of construction, a Service-approved biologist will conduct a training program for all construction personnel including contractors and subcontractors. The training will include, at a minimum, a description of the Central California tiger salamander and its habitat within the action area; an explanation of the species status and protection under state and federal laws; the avoidance and minimization measures to be implemented to reduce take of this species; communication and work stoppage procedures in case a listed species is observed within the project area; and an explanation of the importance of the Environmentally Sensitive Areas (ESAs) and Wildlife Exclusion Fencing (WEF). A fact sheet conveying this information will be prepared and distributed to all construction personnel. The applicant shall provide interpretation for non-English speaking workers. The same instruction shall be provided to any new workers before they are authorized to perform project work.
3. **Implementation of Biological Opinion.** The Corps through its applicant shall ensure the Onsite Project Manager or their designee shall have full authority to implement and enforce all onsite Conservation Measures and Terms and Conditions of this programmatic biological opinion and appendage. The Onsite Foreman/Manager or their designee shall maintain a

copy of this programmatic biological opinion and appendage onsite whenever construction is in progress. Their name(s) and telephone number(s) shall be provided to the Service at least 30 calendar days prior to groundbreaking at the project.

4. **Environmentally Sensitive Areas (ESAs).** Prior to the start of construction, ESAs – defined as areas containing sensitive habitats adjacent to or within construction work areas for which physical disturbance is not allowed – will be clearly delineated using high visibility orange fencing. The ESA fencing will remain in place throughout the duration of the proposed action, while construction activities are ongoing, and will be regularly inspected and fully maintained at all times. The final project plans will depict all locations where ESA fencing will be installed and will provide installation specifications. The bid solicitation package special provisions will clearly describe acceptable fencing material and prohibited construction-related activities including vehicle operation, material and equipment storage, access roads and other surface-disturbing activities within ESAs.
5. **Wildlife Exclusion Fencing (WEF).** Prior to the start of construction, WEF will be installed at the edge of the project footprint in all areas where Central California tiger salamanders could enter the construction area. The location of the fencing shall be determined by the Onsite Project Manager and the Service-approved biologist in cooperation with the Service prior to the start of staging or surface disturbing activities. A conceptual fencing plan shall be submitted to the Service for review and approval prior to WEF installation. The location, fencing materials, installation specifications, and monitoring and repair criteria shall be approved by the Service prior to start of construction. The applicant shall include the WEF specifications on the final project plans. The applicant shall include the WEF specifications including installation and maintenance criteria in the bid solicitation package special provisions. The WEF shall remain in place throughout the duration of the project and shall be regularly inspected and fully maintained. Repairs to the WEF shall be made within 24 hours of discovery. Upon project completion the WEF shall be completely removed, the area cleaned of debris and trash, and returned to natural conditions. An exception to the foregoing fencing measures is that for work sites where the duration of work activities is very short (e.g., 3 days or less) and that occur during the dry season, and the installation of exclusion fencing will result in more ground disturbance than from project activities, then the boundaries and access areas and sensitive habitats may be staked and flagged by the Service-approved biologist prior to disturbance and species monitoring would occur during all project activities at that site. Modifications to this fencing measure may be made on a case-by-case basis with approval from the Service.
6. **Avoidance of Entrapment.** To prevent inadvertent entrapment of animals during construction, all excavated, steep-walled holes or trenches more than 6 inches deep will be covered with plywood or similar materials at the close of each working day or provided with one or more escape ramps constructed of earth fill or wooden planks. The Service-approved biologist shall inspect all holes and trenches at the beginning of each workday and before such holes or trenches are filled. All replacement pipes, culverts, or similar structures stored in the action area overnight will be inspected before they are subsequently moved, capped, and/or buried. If at any time a Central California tiger salamander is discovered, the Onsite Project Manager and Service-approved biologist will be notified immediately and

the Service-approved biologist shall implement the species observation and handling protocol described below under Central California tiger salamander Conservation Measures.

7. **Avoidance of Entrainment.** If a water body is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh not larger than 5 millimeters and the intake should be placed within a perforated bucket or other method to attenuate suction to prevent Central California tiger salamanders from entering the pump system. Pumped water shall be managed in a manner that does not degrade water quality and then upon completion released back into the water body, or at an appropriate location in a manner that does not cause erosion. No rewatering of the water body is necessary if sufficient surface or subsurface flow exists to fill it within a few days, or if work is completed during the time of year the water body would have dried naturally, or for predator or hybrid tiger salamander control purposes. To avoid effects to eggs and larvae, work within seasonal ponds should be conducted when the pond has been dry naturally for at least 30 days. Draining a pond for predator and/or hybrid salamander purposes may be conducted outside these time frames, with approval of the Service.
8. **Wildlife Passage Improvement.** When constructing a road improvement, wherever possible, the Corps through its applicant, with oversight by the Service, will enhance or establish wildlife passage for the Central California tiger salamander across roads, highways, or other anthropogenic barriers. This includes upland culverts, tunnels, and other crossings designed specifically for wildlife movement, as well as making accommodations in curbs, median barriers, and other impediments to terrestrial wildlife movement at locations most likely to be beneficial to the Central California tiger salamander.
9. **Best Management Practices (BMPs)** Stormwater pollution prevention plans (SWPPPs) and erosion control BMPs will be developed and implemented to minimize any wind- or water-related erosion and will be in compliance with the requirements of the Corps. The applicant will include provisions in construction contracts for measures to protect sensitive areas and prevent and minimize stormwater and non-stormwater discharges. Protective measures will include, at a minimum:
 - a. No discharge of pollutants from vehicle and equipment cleaning is allowed into any storm drains or watercourses.
 - b. Vehicle and equipment fueling and maintenance operations must be at least 50 feet away from watercourses, except at established commercial gas stations or at an established vehicle maintenance facility.
 - c. Concrete wastes are to be collected in washouts and water from curing operations is to be collected and disposed of properly. Neither will be allowed into watercourses.
 - d. Spill containment kits will be maintained onsite at all times during construction operations and/or staging or fueling of equipment.
 - e. Dust control will be implemented, and may include the use of water trucks and non-toxic tackifiers (binding agents) to control dust in excavation and fill areas, blocking

temporary access road entrances and exits, and covering of temporary stockpiles when weather conditions require.

- f. Graded areas will be protected from erosion using a combination of silt fences, fiber rolls, etc. along toes of slopes or along edges of designated staging areas, and erosion control netting (such as jute or coir) as appropriate on sloped areas. No erosion control materials that use plastic or synthetic monofilament netting will be used.
- g. Permanent erosion control measures such as bio-filtration strips and swales to receive storm water discharges from paved roads or other impervious surfaces will be incorporated to the maximum extent practicable.
- h. All grindings and asphaltic-concrete waste will be stored within previously disturbed areas absent of habitat and at a minimum of 50 feet from any aquatic habitat, culvert, or drainage feature.

10. Construction Site Management Practices. The following site restrictions will be implemented to avoid or minimize effects on the listed species and its habitat:

- a. A speed limit of 15 miles per hour (mph) in the project footprint in unpaved areas will be enforced to reduce dust and excessive soil disturbance.
- b. Construction and ground disturbance will occur only during daytime hours, and will cease no less than 30 minutes before sunset and will not begin again prior to no less than 30 minutes after sunrise. Night lighting of ESAs should be avoided.
- c. Construction access, staging, storage, and parking areas, will be located outside of any designated ESA. Access routes and the number and size of staging and work areas will be limited to the minimum necessary to construct the proposed project. Routes and boundaries of roadwork will be clearly marked prior to initiating construction or grading.
- d. To the maximum extent practicable, any borrow material will be certified to be non-toxic and weed free.
- e. All food and food-related trash items will be enclosed in sealed trash containers and properly disposed of off-site.
- f. No pets from project personnel will be allowed anywhere in the action area during construction.
- g. A Spill Response Plan will be prepared. Hazardous materials such as fuels, oils, solvents, etc. will be stored in sealable containers in a designated location that is at least 50 feet from hydrologic features.

11. Vegetation Removal. If vegetation clearing and grubbing occurs between February 1 and August 31, a qualified biologist(s) will survey for nesting birds within the area(s) to be disturbed including a perimeter buffer of 100 feet for passerines and 500 feet for raptors before clearing activities begin. All nest avoidance requirements of the Migratory Bird Treaty Act and California Fish and Game Code Sections 3503 and 3503.5 will be observed. All cleared vegetation will be removed from the project footprint to prevent attracting

animals to the project site. A Service-approved biologist will be present during all vegetation clearing and grubbing activities. Prior to vegetation removal, the Service-approved biologist shall thoroughly survey the area for Central California tiger salamanders. Once the Service-approved biologist has thoroughly surveyed the area, clearing and grubbing may continue without further restrictions on equipment; however, the Service-approved biologist shall remain onsite to monitor for Central California tiger salamanders until all clearing and grubbing activities are complete.

12. **Pest Control.** No rodenticides will be used at the project site during construction or long-term operational maintenance in areas that support suitable upland habitat for the Central California tiger salamander.
13. **Reduce Non-Native Predators/Competitors.** A Service-approved individual shall permanently remove, from within the project area, any individuals of non-native species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible. Larval mosquito abatement efforts should be avoided in occupied breeding habitat for the species. The applicant shall have the responsibility to ensure that these activities are in compliance with the California Fish and Game Code. No conversion of seasonal breeding aquatic habitat to perennial aquatic breeding habitat is allowed under this programmatic biological opinion. Creating new perennial water bodies in the vicinity of Central California tiger salamander populations where the ponds could be colonized by predators and hybrid tiger salamanders should also be avoided.
14. **Reduce Spread of Invasive Species.** The Service-approved biologist shall ensure that the spread or introduction of invasive non-native plant species, via introduction by arriving vehicles, equipment, imported gravel, and other materials, shall be avoided to the maximum extent possible. When practicable, invasive non-native plants in the project area shall be removed and properly disposed of in a manner that will not promote their spread. Areas subject to invasive non-native weed removal or disturbance will be replanted with appropriate mix of fast-growing native species. Invasive non-native plant species include those identified in the California Invasive Plant Council's (Cal-IPC) Inventory Database, accessible at: www.cal-ipc.org/ip/inventory/index.php.
15. **Replant, Reseed, and Restore Disturbed Areas.** After project completion, all temporarily affected areas shall be returned to original grade and contours to the maximum extent practicable, protected with proper erosion control materials, and revegetated with native species appropriate for the region and habitat communities on site. A Restoration Plan with success criteria will be submitted to the Service for review and approval, as described under Habitat Compensation Measures below. Temporary effects must be restored to baseline habitat values or better within one year following initial disturbance. Affected areas not fulfilling these criteria are considered permanent.

Conservation Measures for the Central California tiger salamander

1. **Biological Monitor Approval and Stop Work Authority.** The qualifications of all proposed Service-approved biological monitors shall be submitted to the Service for review and written approval at least 30 calendar days prior to project initiation. The Service-

approved biological monitors shall keep a copy of this programmatic biological opinion and appendage in his/her possession when onsite. Through the Onsite Project Manager or his/her designee, the Service-approved biological monitors shall be given the authority to communicate verbally, by telephone, email, or hardcopy with the applicant, project personnel, and any other person(s) at the project site or otherwise associated with the project to ensure that the Terms and Conditions of this programmatic biological opinion and appendage are met. The Service-approved biologist(s) shall have oversight over implementation of the Terms and Conditions in this programmatic biological opinion and appendage, and shall have the authority to stop project activities if they determine any of the associated requirements are not being fulfilled. If the Service-approved biologist(s) exercises this authority, the Service shall be notified by telephone and email within 24 hours. The Service contact is the Coast Bay Division Chief of the Endangered Species Program, Sacramento Fish and Wildlife Office at telephone number (916) 414-6600.

2. **Biological Monitoring Records.** The Service-approved biologist(s) shall maintain monitoring records that include: (1) the beginning and ending time of each day's monitoring effort; (2) a statement identifying the listed species encountered, including the time and location of the observation; (3) the time the specimen was identified and by whom and its condition; (4) the capture and release locations of each individual; (5) photographs and measurements (snout to vent and total length) of each individual; and (6) a description of any actions taken. The Service-approved biologist(s) shall maintain complete records in their possession while conducting monitoring activities and shall immediately provide records to the Service upon request. If requested, all monitoring records shall be provided to the Service within 30 days of the completion of monitoring work.
3. **Agency Access.** If verbally requested before, during, or upon completion of ground disturbance and construction activities, the applicant will ensure the Service can immediately and without delay, access and inspect the project site for compliance with the project description, Conservation Measures, and reasonable and prudent measures of this programmatic biological opinion and appendage, and to evaluate project effects to the Central California tiger salamander and its habitat.
4. **Proper Use of Erosion Control Devices.** To prevent Central California tiger salamanders from becoming entangled, trapped, or injured, erosion control materials that use plastic or synthetic monofilament netting will not be used within the action area. This includes products that use photodegradable or biodegradable synthetic netting, which can take several months to decompose. Acceptable materials include natural fibers such as jute, coconut, twine or other similar fibers. Following site restoration, erosion control materials, such as straw wattles, should not block movement of the Central California tiger salamander.
5. **Biological Monitoring.** A Service-approved biologist(s) shall be onsite during all activities that may result in take of Central California tiger salamanders, and will possess a working wireless/mobile phone whose number will be provided to the Service prior to the start of construction and ground disturbance. The Service will consider the implementation of specific project activities without the oversight of an on-site Service-approved biologist on a case-by-case basis.

6. **Preconstruction and Daily Surveys.** Preconstruction surveys shall be conducted by a Service-approved biologist immediately prior to the initiation of any ground disturbing activities and vegetation clearing that may result in take of Central California tiger salamanders. All suitable aquatic and upland habitat including refugia habitat such as small woody debris, refuse, burrow entries, etc., shall be duly inspected. The Service-approved biologist(s) shall conduct clearance surveys at the beginning of each day and regularly throughout the workday when construction activities are occurring that may result in take of Central California tiger salamanders. Where feasible and only on a case-by-case basis, rodent burrows and other ground openings suspected to contain Central California tiger salamanders that would be destroyed from project activities may be carefully excavated with hand tools. If a Central California tiger salamander is observed, the Service-approved biologist shall implement the species observation and handling protocol outlined below.
7. **Relocation Plan.** At least 15 days prior to initiation of ground disturbance activities, the Corps through its applicant shall prepare and submit a Relocation Plan for the Service's written approval. The Relocation Plan shall contain the name(s) of the Service-approved biologist(s) to relocate Central California tiger salamanders, method of relocation (if different than below), a map, and description of the proposed release site(s) within 300 feet from the project, unless at a distance otherwise agreed to by the Service, and written permission from the landowner to use their land as a relocation site.
8. **Protocol for Species Observation and Handling.** Only Service-approved biologists shall participate in activities associated with the capture, handling, relocation, and monitoring of Central California tiger salamanders. If a Central California tiger salamander is encountered in the action area, work activities within 50 feet of the individual shall cease immediately and the Onsite Project Manager and Service-approved biologist shall be notified. Based on the professional judgment of the Service-approved biologist, if project activities can be conducted without harming or injuring the Central California tiger salamander, it may be left at the location of discovery and monitored by the Service-approved biologist. All project personnel shall be notified of the finding and at no time shall work occur within 50 feet of the Central California tiger salamander without a Service-approved biologist present. If it is determined by the Service-approved biologist that relocating the Central California tiger salamander is necessary, the following steps shall be followed:
 - a. Prior to handling and relocation, the Service-approved biologist will take precautions to prevent introduction of amphibian diseases in accordance with the *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (Service 2003a). Disinfecting equipment and clothing is especially important when biologists are coming to the action area to handle amphibians after working in other aquatic habitats. Central California tiger salamanders shall also be handled and assessed according to the *Restraint and Handling of Live Amphibians* (USGS National Wildlife Health Center 2001).
 - b. Central California tiger salamanders shall be captured by hand, dipnet, or other Service-approved methodology, transported and relocated to nearby suitable habitat outside of the work area and released as soon as practicable the same day of capture. Individuals should be relocated no greater than 300 feet outside of the project site to

areas with an active rodent burrow or burrow system (unless otherwise with written approved by the Service). Holding/transporting containers and dipnets shall be thoroughly cleaned, disinfected, and rinsed with freshwater prior to use within the action area. The Service shall be notified within 24 hours of all capture, handling, and relocation efforts.

- c. If an injured Central California tiger salamander is encountered and the Service-approved biologist determines the injury is minor or healing and the salamander is likely to survive, the salamander shall be released immediately, consistent with the pre-approved Relocation Plan as described above. The Central California tiger salamander shall be monitored until it is determined that it is not imperiled by predators or other dangers.
- d. If the Service-approved biologist determines that the Central California tiger salamander has major or serious injuries as a result of project-related activities the Service-approved biologist, or designee, shall immediately take it to the Lindsay Wildlife Museum or another Service-approved facility. If taken into captivity the individual shall remain in captivity and not be released into the wild unless it has been kept in quarantine and the release is authorized by the Service. The applicant shall bear any costs associated with the care or treatment of such injured Central California tiger salamanders. The circumstances of the injury, the procedure followed and the final disposition of the injured animal shall be documented in a written incident report as described above.
- e. Notification to the Service of an injured or dead Central California tiger salamander in the action area will be made as described under the *Reporting Requirements* section of this programmatic biological opinion, and reported whether or not its condition resulted from project-related activities. In addition, the Service-approved biologist shall follow up with the Service in writing within 2 calendar days of the finding. Written notification to the Service shall include the following information: the species, number of animals taken or injured, sex (if known), date, time, location of the incident or of the finding of a dead or injured animal, how the individual was taken, photographs of the specific animal, the names of the persons who observe the take and/or found the animal, and any other pertinent information. Dead specimens will be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen.

Conservation Measures for Habitat Compensation

To compensate for adverse effects to the Central California tiger salamander from projects appended to this programmatic biological opinion, the Corps will ensure the applicant provides suitable in-kind habitat that will be created, restored, and/or set aside in perpetuity at a ratio of 3:1 for permanent effects and 1:1 for temporary effects (Table 1). Alternatively, credits will be purchased at a Service-approved conservation bank. Compensation plans will be subject to review and approval by the Service. On-site restoration of temporarily affected areas may qualify as compensation at a 1:1 ratio once conditions are verified by the Service, or other method as determined by the Service. Projects that require longer than 12 months from the commencement of

the activity to restore their effects will be considered to have permanent effects and will be required to use the compensation ratio for permanent effects. All compensation will be acquired or secured prior to the beginning of ground disturbance for each project appended to this programmatic biological opinion.

Table 1. Central California Tiger Salamander Habitat Compensation

Level of Effect	Compensation Ratio
Permanent	3:1
Temporary	1:1*

* this often is in the form of on-site restoration.

In-kind habitat compensation will occur prior to initiation of ground or vegetation disturbance activities. Aquatic habitat will be provided for damage or loss of aquatic habitat and upland habitat will be provided for damage or loss of upland habitat. Compensation will be accomplished through the following options: 1) acquire land, by itself, or possibly in conjunction with a conservation organization, State park, State Wildlife Area, National Wildlife Refuge, or local regional park that provides occupied habitat; 2) purchase the appropriate credit units at a Service-approved conservation bank; 3) restore habitat to support the Central California tiger salamander; or 4) other method as determined by the Service including participation within a HCP permit area. The Service and the Corps will approve the applicability of restoration of a proposed site on a case-by-case basis.

Compensation for project effects should occur within the nearest Critical Habitat Unit for the Central California tiger salamander (Critical Habitat Unit), if located within Critical Habitat, OR the nearest Vernal Pool Region, as defined in the Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (Service 2005b), OR within the nearest Recovery Core Area identified in this species' recovery plan (when published), for the project to be appended to this programmatic biological opinion. The Service will consider compensation outside of the nearest Critical Habitat Unit, Vernal Pool Region, or Recovery Core Area on a case by case basis. Any project proponents wishing to compensate in areas other than the nearest Critical Habitat Unit, Vernal Pool Region, or Recovery Core Area in which impacts will occur shall provide a biological rationale for doing so. The Service will then determine if the project and compensation is appropriate to append to this programmatic biological opinion.

Conservation credits or appropriate habitat obtained by the applicant will consist of the following measures:

1. At least thirty (30) calendar days prior to the date of initial ground disturbance, the applicant will acquire habitat occupied by the Central California tiger salamander or habitat that is important to this threatened animal, such as dispersal areas, that the Service has concurred is appropriate in writing. The property will have a conservation easement or other appropriate entitlement, management plan, and endowment to manage the habitat in perpetuity. All of these documents will be reviewed and approved by the Service. The conservation easement will name the Service and/or other appropriate third-party beneficiaries and it will be held by an entity qualified to hold conservation easements subject to approval by the Service. An in-perpetuity endowment to manage the land and monitor the conservation easement will be secured using an escrow

account or other funding assurance acceptable to and approved by the Service. The endowment will be held by a Service-approved entity in an amount agreed to by the Service. A Service-approved management plan will be developed prior to acquisition of land and it will include, but is not limited to, a description of existing habitats and planned habitat creation, restoration and/or enhancement; monitoring criteria for the Central California tiger salamander; an integrated pest management and monitoring plan to control invasive species; habitat creation, restoration and/or enhancement success criteria; and adaptive management strategies if success criteria are not met or to incorporate new scientific data.

OR

2. The applicant will purchase an appropriate number of credits at a Service-approved conservation bank whose service area includes the action area for the proposed appendage to this programmatic biological opinion. Bank credits cannot be used to meet mitigation requirements without Service authorization of their use for a specific permit's requirements. The Service will determine, on a case-by-case basis, whether bank credits provide suitable compensation for the adverse effects of the project for which the credits are proposed to be applied. Conservation credits will be purchased and documentation provided to the Service comprising the Agreement for Sale of Conservation Credits, Bill of Sale, Payment Receipt and Updated Credit Ledger at least fourteen (14) calendar days prior to the date of initial ground disturbance at the project. The Service periodically revises these documents. Contact the Sacramento Fish and Wildlife Office for the most recent templates and guidance (916-414-6600; www.fws.gov/sacramento).

AND/OR

3. The applicant will provide a restoration, monitoring and management plan to the Service and the Corps at least 30 calendar days prior to ground disturbance for review and approval. The plan will include at a minimum success criteria and information regarding site preservation. Prior to initiation of project impacts, the applicant may be required to provide a funding security sufficient to cover the cost of restoring on-site temporary effects which would be held by the Corps, Service, or other acceptable entity. The applicability of this third option will be reviewed and approved by the Service on a case-by-case basis.

The California tiger salamander is listed by the State of California and the applicant shall comply with all applicable California Department of Fish and Wildlife (CDFW) regulations pertaining to mitigation and compensation for State-listed species. In the development of this programmatic biological opinion, the Service worked with CDFW staff to develop consistent Conservation and Compensation Measures and their input is reflected herein. However, CDFW's regulations and policies may differ from the Service which may affect the implementation of specific aspects of these options. The Regional Representative for CDFW should be contacted for current guidance (www.dfg.ca.gov/habcon/envirRevPermit).

Action Area

The action area is defined in 50 CFR 402.02 as "all areas to be affected directly or indirectly by the Federal action, and not merely the immediate area involved in the action." This programmatic consultation addresses minor projects within the following California counties: Alameda, Contra

Costa, San Mateo, Santa Clara, and Solano. Areas within 1,000 feet of the project footprint, parking, equipment storage, stockpile, access, borrow site locations and any areas outside this project footprint that will be temporarily impacted by construction noise and dust during project activities for each Nationwide or other permit are included within the action area. In addition, the action area includes the Compensation lands and areas restored to compensate for project-related impacts.

Analytical Framework for the Jeopardy and Adverse Modification Analysis

Jeopardy Determination

The following analysis relies on four components to support the jeopardy determination for the Central California tiger salamander: (1) the **Status of the Species**, which evaluates the species' range wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the **Environmental Baseline**, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the role of the action area in the species' survival and recovery; (3) the **Effects of the Action**, which determines the direct and indirect effects of the proposed Federal action and the effects of any interrelated or interdependent activities on the species; and (4) **Cumulative Effects**, which evaluates the effects of future, non-Federal activities in the action area on the species.

In accordance with the implementing regulations for section 7 and Service policy, the jeopardy determination is made in the following manner: the effects of the proposed Federal action are evaluated in the context of the aggregate effects of all factors that have contributed to the current status of the Central California tiger salamander and, for non-Federal activities in the action area, those actions likely to affect the species in the future, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild.

The following analysis places an emphasis on using the range-wide survival and recovery needs of the Central California tiger salamander and the role of the action area in providing for those needs as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Adverse Modification Determination

This programmatic biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR §402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

In accordance with policy and regulation, the adverse modification analysis in this programmatic biological opinion relies on four components: (1) *Status of Critical Habitat*, which evaluates the range wide condition of designated critical habitat for the Central California tiger salamander in terms of PCEs, the factors responsible for that condition, and the intended recovery function of the critical habitat at the provincial and range-wide scale; (2) *Environmental Baseline*, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) *Effects of the Action*, which determines the direct and indirect effects of the proposed Federal action and the effects of any interrelated or

interdependent activities on the PCEs and how that will influence the recovery role of affected critical habitat units; and (4) *Cumulative Effects* which evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units. For purposes of the adverse modification determination, the effects of the proposed Federal action on the Central California tiger salamander critical habitats are evaluated in the context of the range-wide condition of the critical habitat at the provincial and range-wide scales, taking into account any cumulative effects, to determine if the critical habitat range-wide would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of currently unsuitable but capable habitat) to serve its intended recovery role for the Central California tiger salamander.

The analysis in this programmatic biological opinion places an emphasis on using the intended range-wide recovery function of the Central California tiger salamander critical habitat and the role of the action area relative to that intended function as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the adverse modification determination.

Status of the Species

Central California tiger salamander

Refer to the California Tiger Salamander Central California Distinct Population Segment (*Ambystoma californiense*) 5-Year Review: Summary and Evaluation (Service 2014) for the current Status of the Species.

Central California Tiger Salamander Critical Habitat

The Service designated critical habitat for the Central California tiger salamander on September 22, 2005 (70 FR 49380) (Service 2005a). The rule identifies approximately 199,109 acres in 19 counties in California. Critical habitat is defined in Section 3 of the Act as: (1) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. In determining which areas to designate as critical habitat, the Service considers those physical and biological features that are essential to a species' conservation and that may require special management considerations or protection (50 CFR 424.12(b)). The Service is required to list the known Primary Constituent Elements (PCE's) together with the critical habitat description. Such physical and biological features include, but are not limited to, the following:

1. Space for individual and population growth, and for normal behavior;
2. Food, water, air, light, minerals, or other nutritional or physiological requirements;
3. Cover or shelter;
4. Sites for breeding, reproduction, rearing of offspring, or dispersal; and
5. Generally, habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The PCE's defined for the Central California tiger salamander were derived from its biological needs. The area designated as revised critical habitat provides aquatic habitat for breeding and non-breeding activities and upland habitat for shelter, foraging, predator avoidance, and dispersal across its range. The PCE's and, therefore, the resulting physical and biological features essential for the conservation of the species were determined from studies of California tiger salamander ecology. Based on the above needs and our current knowledge of the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service determined that the PCE's essential to the conservation of the Central California tiger salamander are:

1. Aquatic Breeding Habitat. Standing bodies of fresh water (including natural and manmade (e.g., stock)) ponds, vernal pools, and other ephemeral or permanent water bodies which typically support inundation during winter rains and hold water for a minimum of 12 weeks in a year of average rainfall;
2. Upland Habitat. Upland habitats adjacent and accessible to and from breeding ponds that contain small mammal burrows or other underground habitat that Central California tiger salamanders depend upon for food, shelter, and protection from the elements and predation; and
3. Dispersal Habitat. Accessible upland dispersal habitat between occupied locations that allow for movement between such sites.

With the designation of critical habitat, the Service intends to conserve the geographic areas containing the physical and biological features that are essential to the conservation of the species through the identification of the appropriate quantity and spatial arrangement of the PCE's sufficient to support the life-history functions of the species. Not all life-history functions require all the PCE's, therefore, not all areas designated as critical habitat will contain all the PCE's. Refer to the final designation of critical habitat for Central California tiger salamander for additional information (Service 2005a).

Environmental Baseline

Central California tiger salamander

Threats to the Central California tiger salamander in the action area include continued habitat loss and degradation due to agriculture and urbanization; hybridization with the non-native barred tiger salamander (*Ambystoma mavortium*) (sometimes referred to as *Ambystoma tigrinum mavortium*) (Fitzpatrick and Shaffer 2004; Riley *et al.* 2003); and predation by introduced species. Central California tiger salamander populations are likely threatened by multiple factors but continued fragmentation and loss of habitat and colonization of non-native salamanders may represent the most significant current threats. Habitat isolation and fragmentation within many watersheds have precluded dispersal between sub-populations. Other threats include disease, predation, competition from introduced non-native species, exposure to chemical contaminants, certain mosquito and rodent control operations, and road-crossing mortality (Service 2003b, 2004). The species' low recruitment and high juvenile mortality makes it particularly susceptible to habitat

loss, fragmentation, urbanization, and construction related harm and mortality. The Central California tiger salamander is also prone to chance environmental or demographic events to which small populations are particularly vulnerable (Service 2003b, 2004, 2014).

The action area includes portions of the Central Coast and Livermore Vernal Pool Regions identified in the Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (Service 2005b). Most of the vernal pools in the Central Coast and Livermore Regions have been destroyed or degraded by urban development, agriculture, water diversions, poor water quality, and long-term overgrazing (Keeler-Wolf *et al.* 1998). During the 1980s and 1990s, vernal pools were lost at a 1.1 percent annual rate in Alameda County (Holland 1998).

Due to the extensive losses of vernal pool complexes and their limited distribution in the Bay Area region, many Central California tiger salamander breeding sites consist of artificial water bodies. Overall, 89 percent (124) of the identified water bodies are stock, farm, or berm ponds used by cattle grazing and/or as a temporary water source for small farm irrigation (California Department of Fish and Wildlife 2011). This places the Central California tiger salamander at great risk of hybridization with non-native tiger salamanders, especially in Alameda and Santa Clara counties if these ponds hold water all year. Without long-term maintenance, the longevity of artificial breeding habitats is uncertain relative to naturally occurring vernal pools that are dependent on the continuation of seasonal weather patterns (Shaffer, in literature, 2003).

Within the action area of the five San Francisco Bay Area counties, the CNDDDB contains 536 occurrences of the Central California tiger salamander. This represents approximately half of all CNDDDB California tiger salamander occurrences in California (all three DPSs combined). Of these 536 occurrences, 50 are considered extirpated or presumed extirpated (CDFW 2014). The Central California tiger salamander has not been documented to occur in Marin, Napa, San Francisco, or Sonoma counties, and is only known to occur in San Mateo County on the border with Santa Clara County. The Sonoma County DPS of the California tiger salamander occurs only in that county and does not overlap in range with the Central California tiger salamander.

The entirety of the proposed action is located within the range and current distribution of the Central California tiger salamander. The action area contains a mosaic of industrial, residential, agricultural, fallow, and open space land uses, although the majority of lands do not contain suitable habitat for the animal. The lands containing suitable habitat range from highly modified and degraded to high quality. The East Bay counties of Alameda and Contra Costa support one of the greatest concentrations of the Central California tiger salamander within its range (Shaffer *et al.* 1993); however, the majority of populations within the action area are thought to consist of a small number of individuals.

The Central California tiger salamander occurs within the action area as demonstrated by: (1) historic and recent observation of the species at numerous locations in the five San Francisco Bay Area counties (CDFW 2014); (2) the biology and ecology of the animal, especially the ability of individuals to move considerable distances and their ability to spend the dry months of the year in habitats with suitable environmental conditions; (3) the presence of numerous seasonal and perennial ponds, including livestock ponds that provide breeding and non-breeding aquatic habitat for the Central California tiger salamander; (4) the presence of upland habitats with rodent burrows and other cover sites; and (5) that the action area also contains upland habitat that provides refuge,

forage, movement, and dispersal habitat for the species.

Central California Tiger Salamander Critical Habitat

The action area encompasses 12 critical habitat units (Units) of the Central California tiger salamander. Ten of the 12 Units occur within Santa Clara County, in the East Bay Geographic Region; and Alameda and Solano each have one Unit, both in the Central Valley Geographic Region. The Units range in size from 194 acres to 9,080 acres and total 46,327 acres across the three counties. Within the five-county action area, no designated critical habitat for the Central California tiger salamander occurs in Contra Costa or San Mateo counties (Service 2005a).

From north to south, the Units in the action area include Unit 2 (Jepson Prairie Unit) in Solano County and Unit 18 (Doolan Canyon Unit) in Alameda County, both of which are in the Central Valley Geographic Region. Units in the East Bay Geographic Region are all in Santa Clara County and include Unit 5 (Poverty Ridge Unit), Unit 6 (Smith Creek Unit), Unit 7 (San Felipe Creek Unit), Unit 8 (Laurel Hill Unit), (Unit 9, Cebata Flat Unit), Units 10a and 10b (Lions Peak Unit), Unit 11 (Braen Canyon Unit), and Unit 12 (San Felipe Unit) which has a small portion in San Benito County.

All of the critical habitat units are essential to the conservation of the species because they are needed to maintain the current geographic and ecological distribution of the species in their respective Geographic Regions (Service2005a). Furthermore, all of the Units contain all three of the PCEs and had extant occurrences of the species at the time of critical habitat designation and continue to do so. Land ownership in 10 out of the 12 Units is entirely private; with the 2 remaining Units having some county and State-owned lands. All Units are subject to ongoing threats of varying intensity and the threats that require special management considerations include urban developments; agricultural land conversions, and associated infrastructure; pesticide application; introduction of non-native predators and competitors such as bullfrogs, mosquito fish, and hybrid tiger salamanders; disturbance activities associated with development that may alter the hydrologic functioning of the aquatic habitat; upland disturbance activities that may alter upland refugia and dispersal habitat; and activities such as road development and widening that may develop barriers for dispersal (Service2005a).

Effects of the Action

Central California Tiger Salamander

Projects authorized by the Corps under the 22 Nationwide and other permits in the five San Francisco Bay Area counties covered by this programmatic biological opinion could have adverse effects on the threatened Central California tiger salamander through capture, harassment, harm, injury and mortality of all life stages.

Ground Disturbance and Construction

Ground disturbance and construction activities associated with projects authorized under the Nationwide and other Corps permits may result in temporary or negligible permanent loss of water bodies utilized by the species, and also result in loss of upland habitat used for dispersal, refugia, and foraging. Central California tiger salamanders that are using small mammal burrows or cracks in the soil within the construction footprint of the proposed action, are likely to be destroyed during grading and ground compaction activities as burrows are crushed or as inhabitants of burrows are

entombed. Central California tiger salamanders may be killed or injured from inadvertent trampling by workers from foot traffic and operation of construction equipment during construction activities. Construction activities may result in harassment from noise, vibration, and night-lighting and may disturb Central California tiger salamanders causing them to leave their upland refugia and increase their exposure to desiccation and predation. Central California tiger salamanders may also become trapped in open excavations or construction trenches, making them vulnerable to desiccation, starvation, and predation. Implementation of the Conservation Measures to minimize habitat alteration and destruction and loss of individuals including reducing the project footprint, clearly demarcating project boundaries, providing worker education programs, having a Service-approved biologist monitor project activities and relocate Central California tiger salamanders out of harm's way, placing escape ramps in excavated holes and trenches, avoiding night-lighting of ESAs, and restoring temporarily disturbed sites with local native plant species will minimize such effects.

The Corps will ensure the permittees compensate for permanent and, in some cases, temporal habitat loss with in-perpetuity preservation and/or restoration of appropriate amounts of Central California tiger salamander habitat. Preservation and protection in perpetuity of high value habitat at an acquired site or purchasing habitat at an approved Conservation Bank will allow for the permanent protection, long-term management, and enhancement of the habitat for the Central California tiger salamander which will contribute to the recovery of this species. In addition, for projects with small impacts, the revegetation/restoration of the site may be appropriate and this may benefit the species by improving habitat functions. This compensation, combined with the implementation of the other Conservation Measures described above, is anticipated to offset the adverse effects of harm resulting from project-related habitat modification or loss.

Preconstruction surveys and the relocation of the Central California tiger salamander may reduce injury or mortality within the project footprint. However, death and injury of individual Central California tiger salamanders could occur at the time of relocation or later in time subsequent to their release. Although survivorship for relocated members of this species has not been determined, survivorship of relocated wildlife, in general, is lower because of intraspecific competition, lack of familiarity with the location of potential breeding, feeding, and sheltering habitats, increased risk of contracting disease in a foreign environment, and the risk of predation. Improper handling, containment, lack of disease prevention measures, or improper transport of individuals will be reduced or prevented by use of a Service-approved biologist with experience with this species, limiting the duration of handling and the distance of relocation, and requiring the proper handling, transport, and release of the animals.

Plastic netting and similar materials that are used for erosion control and other reasons could result in the entanglement and death of Central California tiger salamanders, as well as birds and other wildlife, due to exposure, starvation, strangulation, or predation (Stuart *et al.* 2001). However, through implementation of the Conservation Measure that prohibits their use, the Corps has committed to ensuring the permittees do not utilize these materials.

Roads and Other Impediments to Dispersal

Two primary effects to Central California tiger salamanders from projects that involve roads and highways are vehicle-caused mortality and habitat fragmentation. Injury and mortality occur when Central California tiger salamander cross roads during dispersal and migration and are unable to avoid being run over. Mortality may increase as a result of road widening projects or the placement

of curbs at road edges, and constructed barriers (such as concrete “K” rails) within medians and along roadways which impedes their movement and leaves individuals more vulnerable to being run over by a vehicle (D. Cook, in literature, 2009).

Roads and other development, and highly cultivated areas have other indirect effects in that they can act as partial or complete barriers to Central California tiger salamanders attempting to transit through. As barriers, they can stop or slow gene flow leading to negative, demographic consequences that can cause extinction (Shepard *et al.* 2008). Isolated populations have a greater chance of extinction when new immigrants are not contributing to the gene pool and are less likely to be re-colonized after extinction. Where interchange of Central California tiger salamanders between sites is overall beneficial to a population (i.e., doesn't cause greater mortality), the retrofitting of barriers to allow passage (e.g., crawl spaces under K rails, ramps for curbs, etc.) and the installation of culverts, tunnels, bridges, and other crossings specifically designed to facilitate safe wildlife passage under or across roads can minimize direct mortality as a result of vehicle strikes, and increase habitat connectivity and genetic exchange.

Exposure to Contaminants

The construction of buildings and roadways, as well as the repair and use of roadways, and the use of agricultural chemicals next to Central California tiger salamander habitat can expose this species to chemical contaminants. Substances used in road building materials or to recondition roads or for agricultural purposes can drift or wash off into nearby habitat. Vehicle exhaust emissions can include hazardous substances which may concentrate in soils and in the air along roads (Trombulak and Frissell 2000), and include organic pollutants (i.e. dioxins, polychlorinated biphenyls) (Benfenati *et al.* 1992), and elevated ozone levels in the air (Trombulak and Frissell 2000). Vehicles may leak hazardous substances such as motor oil and antifreeze. A variety of substances could be introduced during accidental spills of materials. Spills can result from leaks in vehicles, small containers falling off vehicles, or from accidents resulting in whole loads being spilled. Large spills may be partially or completely mitigated by clean-up efforts, depending on the substance. Central California tiger salamanders could be exposed to contaminants through inhalation, dermal contact and absorption, direct ingestion of contaminated soil or plants, or consumption of contaminated prey. Exposure to contaminants may cause short- or long-term morbidity. Contaminants may also have a negative effect on Central California tiger salamander prey diversity and abundance, and diminish the local carrying capacity for the listed species. Implementation of Conservation Measures related to managing stormwater runoff, fueling, storage of hazardous materials, having a spill containment plan in place, and informing project personnel of the importance of these measures will reduce the potential for adverse effects from contaminants during project construction. However, most of these measures will not eliminate the effects of contaminants from ongoing use of roads and other infrastructure, and from agricultural practices.

Pest Control Efforts

Mosquito abatement agencies typically introduce nonnative mosquitofish to wetlands, including potential breeding habitat for Central California tiger salamanders. Mosquito fish will prey upon California tiger salamanders (Leyse and Lawler 2000) and introductions of mosquitofish to a wetland can eliminate an entire cohort of developing California tiger salamander embryos or larvae (Jennings and Hayes 1994). Under experimental conditions, mosquito fish have reduced survival of California tiger salamanders in perennial ponds, but that effect was not detected in ponds that mimic vernal pool hydrology (Leyse and Lawler 2000). In addition, both California tiger salamanders and

mosquitofish feed on invertebrates and it is possible that large numbers of mosquitofish may out-compete the salamander larvae for food (Graf and Allen-Diaz 1993). Such adverse effects can be avoided by not adding mosquitofish to known breeding sites of the California tiger salamander.

Rodent control programs could adversely affect the Central California tiger salamander populations if such efforts reduce or eliminate California ground squirrels or pocket gophers located near Central California tiger salamander populations. Reduction or elimination of these fossorial rodents would result in eventual reductions or loss of burrows that provide refugia and upland prey base for the Central California tiger salamander. This in turn could lead to Central California tiger salamanders seeking suboptimal upland habitats, which may increase their exposure to death from predators, desiccation, and starvation. Avoiding or minimizing the application of such programs near Central California tiger salamanders will avoid or reduce such adverse effects.

Alteration in Hydrology of Breeding Sites

Perennial water bodies, by virtue of having year-round water, do not necessarily provide less beneficial habitat for California tiger salamanders than vernal pools (C. Searcy, personal communication, 2012). However, perennial water bodies allow for certain conditions to occur that are not beneficial for the species. For example, perennial ponds could become colonized by several non-native and some native predators of the Central California tiger salamander that either would not occur or not in high numbers in seasonal ponds. These include bullfrogs, crayfish, mosquitofish and other non-native fish, and some native invertebrates (Shaffer *et al.* 1993; Seymour and Westphal 1994; Fisher and Shaffer 1996; Leyse and Lawler 2000; Bobzien and DiDonato 2007). In the California tiger salamander hybrid zone, perennial ponds favor the hybrid salamanders which compete with, prey upon, and inter-breed with Central California tiger salamanders (Riley *et al.* 2003; Fitzpatrick and Shaffer 2004).

Alterations in hydrology that result in converting a vernal pool to a perennial pond would increase the likelihood of the pond being colonized by predators and hybrids, which would then expose Central California tiger salamanders to increased harassment and mortality from predators and possibly lead to their extirpation from a breeding site. This adverse effect can be avoided by not converting seasonal breeding water bodies to perennial water bodies and not creating new perennial ponds in the vicinity of Central California tiger salamander populations where they could be colonized by predatory species. Implementing ongoing actions to keep the perennial water body free or nearly free of predatory, invasive species would also reduce this effect.

Central California tiger salamander Critical Habitat

A key element of this programmatic biological opinion is that each separate permit action appended will have minimal adverse effects and low levels of incidental take of the Central California tiger salamander. Those projects that exceed minimal adverse effects to this species and its critical habitat, including direct, indirect, and cumulative effects, would require separate consultation. As a result, the Service anticipates that the activities associated with the proposed action could negatively affect some of the PCEs of Central California tiger salamander critical habitat within the action area. However, these activities will only result in minor effects to habitat and these activities (implemented with the Conservation Measures) will not prevent critical habitat from providing essential conservation values for the Central California tiger salamander. While disturbance within critical habitat may prevent some Central California tiger salamanders from using portions of the critical

habitat for essential life functions whether temporarily (e.g., disturbance that can be restored to pre-project conditions within one calendar year from the date of initial ground disturbance) or permanently (e.g., disturbance that cannot be restored to pre-project condition within one calendar year), they will still be able to complete their essential ecological and biological functions in the remaining areas of critical habitat. All critical habitat units will retain their PCEs and the PCEs within each critical habitat unit will still remain functional. Therefore, the designated critical habitat for the Central California tiger salamander will still be able to perform its intended functions and conservation role.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this programmatic biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Numerous non-Federal activities continue to adversely affect, primarily through the damage or destruction of habitat, the Central California tiger salamander in the action area. In addition, the same activities affect this threatened species also affect its critical habitat. Loss and degradation of habitat affecting this listed species with or without Service authorization continues as a result of urbanization; road construction and maintenance; utility right-of-way management; flood control projects that may not be funded, permitted, or constructed by a Federal agency; and continuing conversion of rangelands to more intensive agricultural crops. This threatened amphibian also is adversely affected by ground squirrel reduction, mosquito control, including the planting of non-native mosquito fish, and road-related mortality. Unauthorized take is occurring, and the Service continues to request re-initiation of projects when project descriptions have changed markedly since our biological opinions were issued.

For the past 30 years, the encroachment of high- and low-density urban growth into areas inhabited by the Central California tiger salamander has intensified and is expected to continue. The Association of Bay Area Governments (ABAG) predicts that between 2010 and 2040 the nine-county San Francisco Bay Area is projected to add 2.1 million people and 660,000 homes. During that time, approximately 77 percent of that population increase (1.6 million people) and 78 percent of the new housing (516,600 units) will occur within the counties in the action area (ABAG 2013). This growth will continue to place pressure on the conversion of grazing and open space lands to urban uses, which further imperils the Central California tiger salamander with ongoing habitat loss.

Conclusion

After reviewing the current status of the Central California tiger salamander, the environmental baseline for the action area; the effects of projects potentially authorized under the 22 Nationwide and other Corps permits in five of the San Francisco Bay Area counties, and the cumulative effects; it is the Service's biological opinion that the projects which meet the qualifications for this programmatic biological opinion are not likely to jeopardize the continued existence of the Central California tiger salamander. Although critical habitat for the Central California tiger salamander will be affected, none will be destroyed or adversely modified by the projects that meet the qualifications of this programmatic biological opinion, because these projects will be limited to a small proportion

of the critical habitat and will not affect the ability of the remaining critical habitat to conserve the Central California tiger salamander. We further based this determination on the Description of the Action that provides numerous Conservation Measures that would be implemented to minimize adverse effects of the future proposed projects on the Central California tiger salamander and its critical habitat. Implementation of the Habitat Compensation Measures ensures more occupied habitat will be conserved than affected. As a result, project-related effects to these species would not rise to the level of precluding recovery of these species or reducing the likelihood of their survival.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement. The Incidental Take Statement accompanying this programmatic biological opinion does not address the restrictions or requirements of other applicable laws.

The measures described below are non-discretionary, and must be implemented by the Corps so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require the (applicant) to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Corps must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

Amount or Extent of Take

The Service anticipates that incidental take of the Central California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Due to the difficulty in quantifying the number of the Central California tiger salamanders that will be taken

as a result of the proposed action, the Service is quantifying take incidental to the project as the harm and harassment of all eggs, egg masses, larvae, metamorphs, juveniles, and/or adults inhabiting or utilizing a total of seventy-five (75) acres for the five (5) year duration of this programmatic biological opinion. Reinitiation will be triggered if the amount of incidental take is exceeded by the Corps.

Effect of the Take

The Service has determined that this level of anticipated take for projects potentially authorized under the 22 Nationwide and other Corps permits in the five San Francisco Bay Area counties, as appended to this programmatic biological opinion, is not likely to result in jeopardy to the Central California tiger salamander, or adverse modification or destruction of its designated critical habitat.

Reasonable and Prudent Measure

1. The Corps shall minimize adverse effects to the Central California tiger salamander by fully implementing the conservation measures described in this programmatic biological opinion.

Reporting Requirements

For each Nationwide or other Corps permit appended to this programmatic biological opinion, the Service-approved biologist will maintain a written record that will include, but is not limited to: (1) beginning and ending time of each day's construction activity and monitoring effort; (2) Central California tiger salamanders, and wildlife species, that were observed, including the specific time and location; (3) description of any actions taken to protect the Central California tiger salamander or its habitat; (4) and any issues related to implementation of the Conservation Measures that could be modified for similar future projects. The Service-approved biologist will submit the original written record to the Service within fourteen (14) calendar days of the completion of their monitoring, or immediately upon verbal, email, or written request from the Service, or their authorized agent.

Injured Central California tiger salamanders must be cared for by a licensed veterinarian or other qualified person such as the Service-approved biologist; dead individuals shall be placed in a zip-lock® plastic bag containing a piece of paper with the date, time, and location where the animal was found, and who found it legibly written in permanent ink, and then placed in a freezer located in a secure location. The Service must be notified within twenty-four (24) hours via telephone and electronic mail of the discovery of death or injury to any listed species that occurs or is suspected to have occurred as a result of project related activities, or is observed in or near the action area. Notification must include, at a minimum, the date, time, and location of the incident or of the finding of a dead or injured animal clearly indicated on a USGS 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information. The Service contacts are the Coast Bay Forest Foothills Division Chief at telephone (916) 414-6600.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service has developed the following conservation recommendations:

1. Implement actions within the species' 5-year review or the Recovery Plan of the Central California tiger salamander, when published.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed and/or proposed species or their habitats, the Service requests notification of the implementation of this recommendation.

REINITIATION NOTICE

This concludes formal consultation on the 22 Nationwide and other Corps permits in Alameda, Contra Costa, San Mateo, Santa Clara, and Solano counties, California. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species that was not considered in this opinion; or (4) a new species is listed that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions concerning this programmatic biological opinion on projects authorized under the 22 Nationwide and other Corps permits in the five San Francisco Bay Area counties, please contact Kate Symonds (Kate_Symonds@fws.gov) or Ryan Olah (Ryan_Olah@fws.gov), Coast Bay Division Chief, at the letterhead address, or at telephone (916) 414-6600.

Sincerely,



Jennifer M. Norris
Field Supervisor

cc:

Lisa Mangione, U.S. Army Corps of Engineers, San Francisco, California
Craig Weightman, California Department of Fish and Wildlife, Yountville, California

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